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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/797,241	03/10/2004	Mark Muenzer	074313.0107	2985

58174 7590 11/01/2006

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EXAMINER

THOMAS, LUCY M

ART UNIT	PAPER NUMBER
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2836

DATE MAILED: 11/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/797,241	Applicant(s) MUENZER ET AL.	
	Examiner Lucy Thomas	Art Unit 2836	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 August 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-5 and 7-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-5, 7-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date. _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b), the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 7-10, 16, and 2-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Marquardt et al. (US 5,650,906). Regarding Claim 7, Marquardt et al. discloses a circuit arrangement for limiting an overvoltage at a freewheeling device arranged in parallel with a semiconductor power switch (Figures 1 and 2), comprising at least a first and a second semiconductor power switch T1, T2 each parallel-connected with a freewheeling device 24, 26 being connected in series, an output terminal R (S, T) arranged between the first and second semiconductor power switch for coupling with to an inductive load, and a feedback path between the output terminal and a common input of a push-pull stage 30 of a driver 6 (see path from C to G in Figures 1 and 2, and the details of the feedback path in Figure 3, C connected to the common input of the push-pull stage 30 of amplifier 46, the amplifier output 54 is connected to the input of push-pull stage, Column 5, lines 58-59, Column 6, lines 1-6) connected to its control terminal G of each power switch (Column 3, lines 40-60). Figure 2 of the Marquardt reference shows the block diagram of the circuit arrangement and Figure 3 shows the details of the feedback connection to an amplifier stage of a driver and shows the

Art Unit: 2836

feedback path connection as recited, and therefore, meets the limitations of the amended claim.

Regarding Claim 8, Marquardt et al. discloses a circuit arrangement, wherein a feedback path has at least one component 20 or 22 (Figure 1), which permits a driving of the control terminal only above a threshold voltage, so that only voltages greater than a predetermined threshold value are fed back to the control terminal.

Regarding Claim 9, Marquardt et al. discloses a circuit arrangement, wherein the feedback path has a component 28 (Figure 2), via which a feedback to the control terminal is effected in a manner proportional to the voltage rise at the freewheeling device.

Regarding Claim 10, Marquardt et al. discloses a circuit arrangement, wherein two diodes 16, 20 or 18, 22 (see Figure 1) connected in antiparallel are used as the components in the feedback path. The reference has Zener diode elements.

Regarding Claim 16, Marquardt discloses an IGBT power transistor T1, T2 as the semiconductor power switch (Figures 1 and 2, Column 2, lines 4-8).

Regarding method Claims 2-5, the recited method steps would necessarily be performed when implementing the circuit arrangement for limiting the overvoltage at a freewheeling device recited in Claims 7-10.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marquardt et al. (US 5,650,906) in view of Erckert (US 6,100,742). Regarding Claim 11, Marquardt fails to disclose a capacitor used as the component in the feedback path. Erckert discloses a capacitor 34 (Figure 1), C2 (Figure 5). It would have been obvious to those skilled in the art to modify Marquardt's circuit to include a capacitor in the feedback path as taught by Erckert because capacitors respond to higher frequency events (like transients), and in case of overvoltages across the freewheeling diode, aid the turn-on of the power transistor.

5. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marquardt et al. (US 5,650,906) in view of Goeser et al. (US 6,531,908). Regarding Claim 12, Marquardt fails to disclose a parallel circuit comprising Zener diodes and an external capacitor used in the feedback path. Goeser et al. discloses a parallel circuit comprising Zener diodes and an external capacitor used in the feedback path (see Figure 2). It would have been obvious to those skilled in the art to modify Marquardt's circuit to include a parallel circuit comprising Zener diodes and an external capacitor in the feedback path as taught by Goeser, because both the Zener diode and the capacitor increase the accuracy of transient response with respect to voltage threshold and frequency and in case of overvoltages across the freewheeling diode to switch-on the power transistor, and a parallel arrangement provides a faster response.

6. Claims 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marquardt et al. (US 5,650,906) in view of Stephan et al. (DE 100 317 78) and

McKenzie (US 5,336,985). Claim 13 basically recites combined limitations of Claims 7 and 8, except for a transformer in series with an amplifier in the feedback path.

Maquardt does not disclose a transformer in series with an amplifier in the feedback path. Stephan discloses a circuit arrangement comprising a semiconductor power switch 1, wherein a feedback path (see 4 in Abstract figure) being designed to utilize the current gradient to drive the control gate of the transistor 1. Stephan discloses the feedback block as a control circuit, not specifying the components inside, and does not specify the feedback comprising a transformer in series with an amplifier.

McKenzie discloses a feedback path comprising a transformer 26 in series with an amplifier (see operational amplifier 48 in series with the transformer 26 in Figure 1). It would have been obvious to those skilled in the art to modify Marquardt's and Stephan's circuit and to provide a transformer in series with an amplifier as taught by McKenzie, because the use of transformer in the feedback facilitate the protection of the circuit from reverse current spike and additional overvoltage due to leakage inductance, and the amplifier to adjust the feedback amount.

Regarding Claim 14, Stephan discloses the circuit arrangement, wherein a voltage drop across internal and/or external leakage inductances is utilized for feedback (see Abstract).

Regarding Claim 15, McKenzie discloses the circuit arrangement, wherein the current rise is feedback through the induction in a transformer 26.

Response to Arguments

7. Applicant's arguments filed 8/25/2006 have been fully considered.

Regarding Applicant's arguments toward the Marquardt reference: Figure 2 of the Marquardt reference shows the block diagram of the circuit arrangement and Figure 3 shows the details of the feedback connection to a push-pull stage of gate driver. The reference discloses a feedback path between the output terminal and a common input of a push-pull stage 30 of a driver 6 (see path from C to G in Figures 1 and 2, and the details of the feedback path in Figure 3, C connected to the common input of the push-pull stage 30 of amplifier 46, the amplifier output 54 is connected to the input of push-pull stage, Column 5, lines 58-59, Column 6, lines 1-6) connected to its control terminal G of each power switch (Column 3, lines 40-60). Figure 3 of the Marquardt reference shows the details of the feedback connection to the push-pull stage of a gate driver as recited, and therefore, meets the limitations of the amended claims 7 and 5.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

Art Unit: 2836

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lucy Thomas whose telephone number is 571-272-6002. The examiner can normally be reached on Monday - Friday 8:00 AM - 4:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus can be reached on 571-272-2800 x36. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LT
10/27/2006


BURTON S. MULLINS
PRIMARY EXAMINER